

Plumbing

Levels: Grades 10-12
Units of Credit: 1.0
CIP Code: 46.0501
Prerequisite: None

CORE STANDARDS, OBJECTIVES AND INDICATORS

STANDARD **Students will receive an orientation to the plumbing trade.**
460501-01

OBJECTIVES

460501-0101 Describe the history of the plumbing trade.
460501-0102 Identify the stages of progress within the plumbing trade.
460501-0103 Identify the responsibilities of a person working in the construction industry.
460501-0104 State the personal characteristics of a professional.
460501-0105 Explain the importance of safety in the construction industry.

STANDARD **Students will be able to understand and demonstrate the use of plumbing tools.**
460501-02

OBJECTIVES

460501-0201 Identify the basic hand and power tools used in the plumbing trade.
460501-0202 Demonstrate the proper maintenance procedures to be used for hand and power tools.
460501-0203 Explain safety as it applies to plumbing tools.

STANDARD **Students will be able to understand and demonstrate the use of plumbing math.**
460501-03

OBJECTIVES

460501-0301 Identify the parts of a fitting and use common pipe measuring techniques.
460501-0302 Use fitting dimension tables and a framing square to determine fitting allowances and pipe makeup.
460501-0303 Calculate end-to-end measurements by figuring fitting allowances and pipe makeup.
460501-0304 Use a framing square to find the center of fittings.
460501-0305 Figure 45-degree offsets and travel using the Pythagorean theorem.
460501-0306 Figure 45-degree offsets and travel using the constant method.
460501-0307 Figure 45-degree offsets and travel using a framing square or tape measure.

**STANDARD
460501-04**

Students will be able to understand and use plumbing drawings.

OBJECTIVES

460501-0401

Identify pictorial (isometric and oblique), schematic, and orthographic drawings, and discuss how different views are used to depict information about objects.

460501-0402

Identify the basic symbols used in schematic drawings of pipe assemblies.

460501-0403

Explain the types of drawings that may be included in a set of plumbing drawings and the relationship between the different drawings.

460501-0404

Interpret plumbing-related information from a set of plumbing drawings.

460501-0405

Convert plan view drawings to simple isometric drawings.

460501-0406

Use an architect's scale to draw lines to scale and to measure lines drawn to scale.

460501-0407

Discuss how local code requirements apply to certain drawings.

**STANDARD
460501-05**

Students will be able to understand and demonstrate the use of plastic pipe and fittings.

OBJECTIVES

460501-0501

Identify the common types of materials and schedules of plastic piping.

460501-0502

Identify the common types of fittings and valves used with plastic piping.

460501-0503

Identify and determine the kinds of hangers and supports needed for plastic piping.

460501-0504

Identify the various techniques used in hanging and supporting plastic piping.

460501-0505

Demonstrate the ability to properly measure, cut, and join plastic piping.

460501-0506

Follow basic safety precautions for the installation, operation, and maintenance of plastic tubing.

460501-0507

Identify the hazards and safety precautions associated with plastic piping.

**STANDARD
460501-06**

Students will be able to understand and demonstrate the use of copper pipe and fittings.

OBJECTIVES

460501-0601

Select the correct types of materials for copper piping systems.

460501-0602

Identify types of fittings and valves and their uses.

460501-0603

Select the correct hanger or support for the application.

- 460501-0604 Select the appropriate personal protective equipment for working with copper piping.
- 460501-0605 Correctly measure, cut, ream, and join copper piping.

STANDARD
460501-07 **Students will be able to understand and demonstrate the use of fixtures and faucets.**

OBJECTIVES

- 460501-0701 Identify the basic types of materials used in the manufacture of plumbing fixtures.
- 460501-0702 Discuss common types of sinks, lavatories, and faucets.
- 460501-0703 Discuss common types of bathtubs, bath-shower modules, shower stalls, and shower baths.
- 460501-0704 Discuss common types of toilets, urinals, and bidets.
- 460501-0705 Discuss common types of drinking fountains and water coolers.
- 460501-0706 Discuss common types of garbage disposals and domestic dishwashers.

STANDARD
460501-08 **Students will be able to understand drain, waste and vent (DWV) Systems.**

OBJECTIVES

- 460501-0801 Explain how waste moves from a fixture through the drain system to the environment.
- 460501-0802 Identify the major components of a drainage system and describe their functions.
- 460501-0803 Identify types and parts of traps and explain the importance of traps, and how traps lose their seals.
- 460501-0804 Identify the various types of DWV fittings and describe their application.

STANDARD
4605001-09 **Students will be able to understand water, distribution systems.**

OBJECTIVES

- 460501-0901 Discuss how water moves from the source, through the water distribution system, and to the fixture.
- 460501-0902 Identify the major components of water distribution system and describe the function of each component.
- 460501-0903 Explain the relationships between the components of a water distribution system.

PROFESSIONAL DEVELOPMENT

STANDARD
460501-10 **The student will understand the need for professional development.**

OBJECTIVES

460501-1001	Complete a personal inventory
460501-1002	Set and meet goals
460501-1003	Motivate yourself
460501-1004	Decision making
460501-1005	Manage time
460501-1006	Organize personal belongings and lab equipment
460501-1007	Communicate verbally
460501-1008	Write effective communications
460501-1009	Establish a personal reading program
460501-1010	Develop effective work skills and attitudes
460501-1011*	Master a working knowledge of SkillsUSA <ul style="list-style-type: none">▪ state the SkillsUSA motto▪ state the SkillsUSA creed▪ learn the SkillsUSA colors▪ describe the official SkillsUSA dress▪ describe the procedure for becoming a SkillsUSA officer

**STANDARD
460501-11****The student will understand the need for leadership skills.****OBJECTIVES**

460501-1101	Serve on a committee
460501-1102	Prepare an agenda
460501-1103	Assist in planning a meeting
460501-1104	Review basic parliamentary procedure <ul style="list-style-type: none">▪ Make a main motion
460501-1105	Participate in a school project
460501-1106	Attend a community meeting
460501-1107	Practice effective speaking
460501-1108	Present a 3-5 minute talk
460501-1109	Implement a leadership project
460501-1110*	Master a working knowledge of SkillsUSA <ul style="list-style-type: none">▪ Describe the meaning of the SkillsUSA emblem▪ State the SkillsUSA pledge▪ Describe the duties of a SkillsUSA officer

**STANDARD
460501-12****The student will understand the need for career planning.****OBJECTIVES**

460501-1201	Define your future occupation
460501-1202	Survey employment opportunities
460501-1203	Report on a trade journal article
460501-1204	Explore opportunities for advanced training

460501-1205	Conduct a worker interview
460501-1206	Contact a professional association
460501-1207	Explore entrepreneurship opportunities
460501-1208	Give a talk about your career
460501-1209	Review career goals

STANDARD
460501-13 **The student will understand the need for employment skills.**

OBJECTIVES

460501-1301	Develop a list of work standards to follow at school and on the job.
460501-1302	Evaluate your personal ethics <ul style="list-style-type: none"> ▪ Evaluate your personal ethics against acceptable workplace ethics
460501-1303	Build a job search network
460501-1304	Find job leads
460501-1305	Write a resume
460501-1306	Create a job portfolio
460501-1307	Complete a job application
460501-1308	Write a business letter and memo
460501-1309	Participate in an actual or simulated job interview

*SkillsUSA PDP requirements - optional but recommended